APPENDIX A
Ergonomic Risk Factor Descriptions and Examples To Be Included In Required Awareness Training [Section C (1) (a)]
Non-Mandatory

1. Ergonomic **risk factors** are characteristics of a job that contribute to the creation of ergonomic hazards that may negatively impact job performance including quality, productivity, as well as worker health. Section 'C' of the rule requires that awareness training covers what are risk factors and how to recognize them.

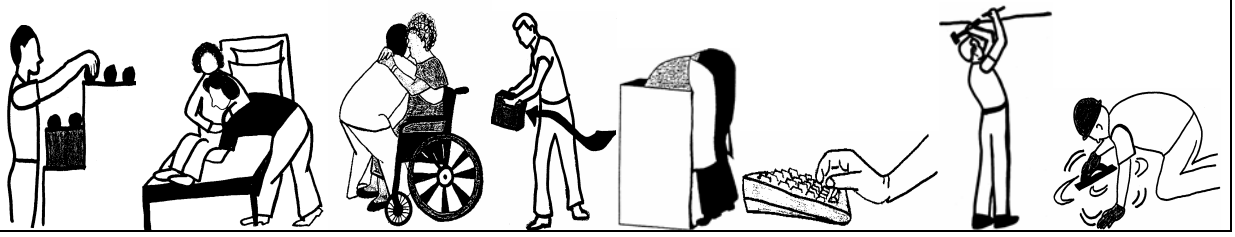
   Risk factors are present at varying levels for different jobs and tasks. Generally, the greater the exposure is to a single risk factor or combination of risk factors, the greater the probability of a musculoskeletal disorder. The mere presence of a risk factor does not necessarily mean that an employee performing a job is at undue risk of injury.

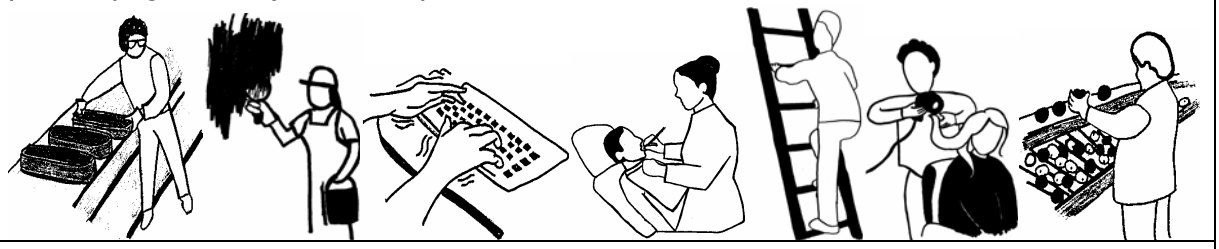
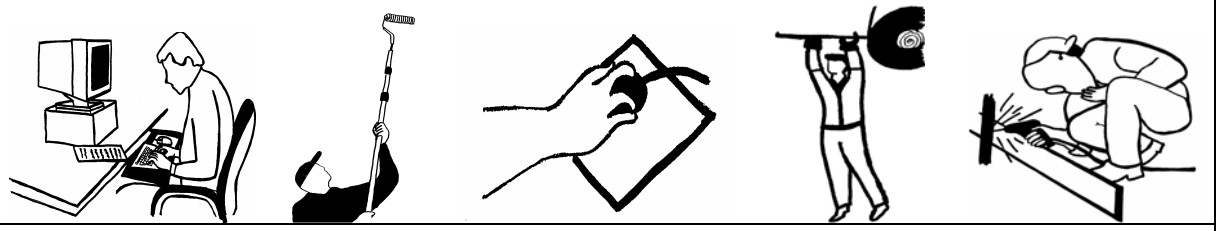
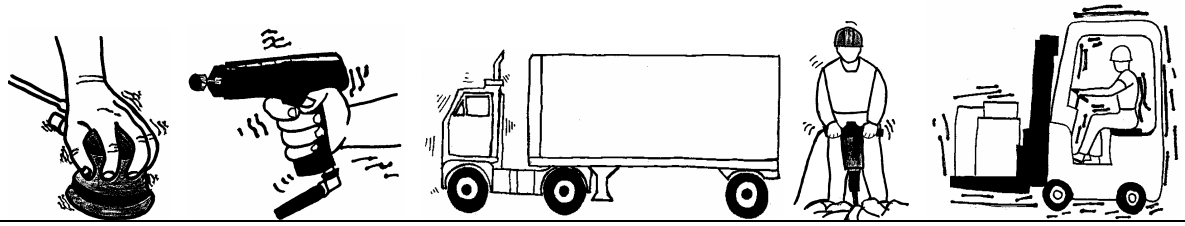
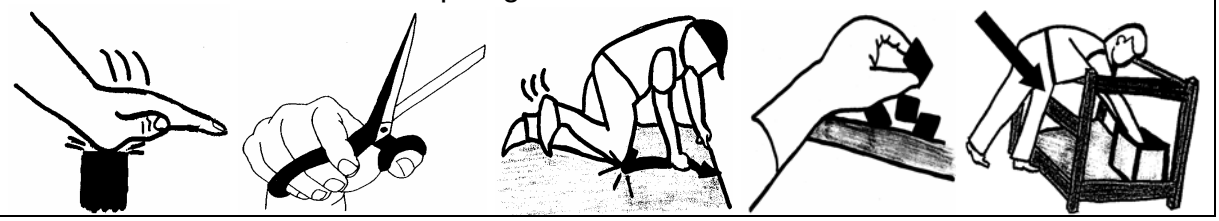
2. For job assessment of ergonomic risk factors consider the following, as described in Table 1:
   a. Awkward postures and motions
   b. Forceful exertions
   c. Repetition
   d. Sustained exertions
   e. Vibration
   f. Contact stress
   g. Cold temperature

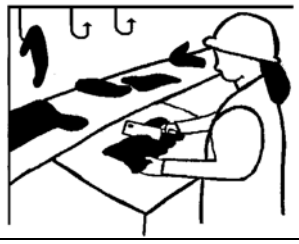
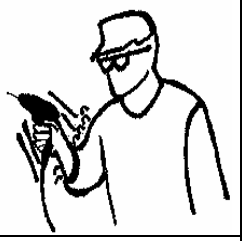
   Risk factors may be evaluated by the following exposure properties:
   h. Duration
   i. Recovery
   j. Magnitude

Table 1

Risk Factor Descriptions With Examples and Exposure Properties

a. Awkward Postures and Motions	Posture is the position your body is in that affects muscle groups and body parts involved in physical activity. Examples of awkward postures and motions include extended reaching, twisting, bending, kneeling, squatting, or working overhead. 

b. Forceful Exertions	Force is the amount of physical effort required to perform a task such as heavy lifting, or to maintain control of equipment or tools. The amount of force required to complete the task depends on the type of grip; the size, shape and weight of an object; posture; and the type of activity. Examples include: tasks involving gripping, lifting, carrying, lowering, pushing, pulling, holding, assembling, connecting, using a hand tool, and maintaining control of a powered tool. 
c. Repetition	A motion or activity that is repeated over and over again during a specific time period (e.g. work cycle, shifts). 
d. Sustained Exertions	A body position that is maintained for an extended period of time. 
e. Vibration	The oscillatory motion of an object. Vibration can be described in terms of its frequency, acceleration, and direction of motion. Examples of exposure to vibration include: operating tools such as sanders, grinders, chippers, routers, drills, chain saws and other saws; jackhammers; or sitting/standing on vibrating surfaces such as driving a truck. 
f. Contact Stress	Resting or pressing body parts against a hard surface or sharp edge can result in compression of nerves, muscles, tendons, blood vessels and other tissues. Examples include: pounding with the palm of hand; tools digging into the palm of hand; tools digging into the sides of fingers; or resting the knee, elbow, forearm, or wrist on a hard surface or sharp edge. 

g. Cold Temperature	Exposure to low temperatures that impacts the function of specific body parts, primarily hands and fingers. Examples of exposure to cold temperatures include: handling of frozen or refrigerated materials, cold environments, immersion of body parts in cold substances, or cold air exhaust.    
h. Duration	The amount of time a person is exposed to one or more risk factors.
i. Recovery	Periods of reduced exposure to risk factors. These may be rest breaks, pauses in work activity, or motions and exertions that provide specific body parts the opportunity to recuperate.
j. Magnitude	The amount of each risk factor involved. Examples include: the amount of force applied, the angle/position of the back or the repetition rate.

Risk Factor Assessment

"Do I Have An Ergonomic Hazard?"

Ergonomic hazards are determined by evaluating the presence of risk factors and exposure properties. See table 1 for a description of risk factors and exposure properties. The presence of an ergonomic hazard can be made apparent by many different methods including an ergonomic risk factor assessment (as described in appendix C (1) (b)).

"How Do I Do An Assessment?"

There are various quantitative "scoring" systems available to make conducting ergonomic risk factor assessments simpler and more consistent. Ultimately the determination of the presence of an ergonomic hazard is a judgment. The employer should choose assessment processes that fit the task or work procedure being evaluated. To determine how simple or complex an assessment process is needed, the employer should consider factors such as: type and complexity of operation, number of affected employees, and workplace musculoskeletal injury incidence history.

For further assistance in ergonomic risk factor assessment processes see the web-sites listed in Appendix D.

Appendix B
Signs and Symptoms - Descriptions and Reporting
To Be Included In Required Awareness Training [section C (1) (b)]
Non-Mandatory

To assist with this requirement, here is some information on Signs/Symptoms:

i. Exposure to ergonomic hazards over a period of time can lead to conditions affecting muscles, nerves, tendons, ligaments, joints, cartilage or spinal discs. Individuals with such conditions typically report one or more of the following symptoms:
- warmth or heat
- redness
- swelling
- aching
- pain
- burning
- spasm
- weakness
- stiffness
- numbness
- tingling
- loss of function/restricted movement
- joint catching/locking/giving-out

ii. Initially, the individual will most likely complain of minimal symptom(s) in a localized area of involvement. If the ergonomic hazard(s) causing or aggravating the condition is reduced or eliminated, the symptom(s) will often resolve. (Note: It is not uncommon for a combination of work-related and personal life-related activities to be contributing to the condition.)

iii. Over time, if the condition is left untreated and/or the ergonomic hazard(s) causing or aggravating the condition is not addressed, then the number and/or severity of symptoms will often increase. As the condition worsens, more complicated interventions often become necessary to alleviate the symptoms.

iv. Early reporting of signs and symptoms is important. For further assistance in reporting an ergonomic hazard see Appendix D for web-site resources.

APPENDIX C
Process for Assessing and Responding to Ergonomic Risk Factors Descriptions and Resources
Non-Mandatory

In an effort to assist in the requirements of Section D of the rule which reads as follows:

Section D

Process for Assessing and Responding to Ergonomic Occupational Risk Factors.

(1) An employer shall establish and utilize an effective process that includes the following:

(a) Employee involvement.

To assist with this requirement, here are some examples of employee involvement may include:

i. Suggestion box.
ii. Employees involved in accident reviews.
iii. Joint Labor and Management Health and Safety committee.
iv. Union assistance.
v. Employee job self-assessment.
vi. Proactive sign and symptom reporting.
vii. Routine safety talks.
viii. Peer observation and intervention program.
ix. Employee wellness program

(b) Assessment of ergonomic occupational risk factors.

To assist with this requirement, note the following suggestions:

i. Depending on the nature of your operations and work practices, ergonomic assessments range from simple to in-depth processes.
ii. Simple processes may include employee job self-assessment, health and safety committee review, contacting your workman's compensation/disability insurance company and/or safety consultants.
iii. In-depth processes may include using publicly and commercially available assessment tools (for example lifting equations).

(c) Elimination, reduction, or control of ergonomic hazards where economically and technically feasible.

To assist with this requirement, note the following suggestions:

i. Examine the results of the assessments completed and identify opportunities to address the risk factors.

ii. **Engineering controls** could include but are not limited to examples such as lift assists, redesigning workstation layout or workflow redesign.

iii. **Administrative controls** could include but are not limited to examples such as job rotation, job enlargement, job work-rest cycle, training and focused re-training.

Examples of Controls

Industry	Tasks	Example of Risk Factor(s)	Example of Engineering Controls	Example of Administrative Controls
		[Requirements of Rule Section D(b)]	[Requirements of Rule Section D(c)]	
Health Care	Transferring Patients	Force and Awkward Posture	Use mechanical lift assists	Use multiple employees
Manufacturing	Pallet Loading	Force and Awkward Posture	Lift table or automatic palletizer	Reinforcement of safe lifting procedures
Office	Data Entry/ Word Processing	Contact Stress and Awkward Posture	Adjustable keyboard tray	Stretch breaks

(2) Employers with an effective ergonomic program established and documented by the effective date of these rules are exempt from the rules in this section.

APPENDIX D
Resource
Non-Mandatory

For further assistance in training; occupational risk factors; signs/symptoms; reporting; assessing and responding to occupational risk factors; recordkeeping; and an effective ergonomic program contact MIOSHA, OSHA, or NIOSH, your union, or industry association.

MIOSHA Michigan Occupational Safety and Health Administration Consultation Education & Training Division (CET)	www.michigan.gov/cet Phone: 517.322.1856
OSHA Federal Occupational Safety and Health Administration	http://www.osha.gov/SLTC/ergonomics/index.html
NIOSH National Institute of Safety and Health	http://www.cdc.gov/niosh/topics/ergonomics/